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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/564,406	01/13/2006	Chang-Hae Kim	3449-0569PUS1	1805

2292 7590 06/23/2008

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EXAMINER	
HOLLWEG, THOMAS A	

ART UNIT	PAPER NUMBER
2879	

NOTIFICATION DATE	DELIVERY MODE
06/23/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/564,406	KIM ET AL.	
	Examiner	Art Unit	
	Thomas A. Hollweg	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 March 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 January 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/13/2006, 8/6/2007, 3/7/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statements (IDS) submitted on January 13, 2006, August 6, 2007, and March 7, 2008 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Objections

2. The following claims are objected to because of the following informalities:

   a. Claims 14, 17 and 18, the word "ligth" is misspelled.

   b. Claim 16, "the second-based phosphor" lacks antecedent basis. For examination it is assumed that this is a reference to the second silicate phosphor. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. The limitation regarding particle size, "d90 ≤ 20 □, 5 ≤ d50 ≤ 10 □" is not understood because the symbol "□" is not recognized and would not be understood by one having ordinary skill in the art. For examination it is assumed that the symbol "□" is intended to mean micrometers (μm).

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-3 and 5-12 are rejected under 35 U.S.C. 102(e) as being anticipated by Maeda et al., U.S. Patent Application Publication No. 2004/0104391.

8. With regard to clam 1, in figures 1, 2 and 3, Maeda discloses a light emitting device comprising: a light emitting chip (1); and a phosphor (2) through which a first light emitting from the light emitting chip (1) passes, wherein the phosphor comprises a first silicate phosphor exciting a second light having a first centered emission peak using the first light and a second silicate phosphor exciting a third light having a second centered emission peak using the first light [0177-0202].

9. With regard to claim 2, in figures 1, 2 and 3, Maeda discloses that the first centered emission peak is in a range of 550-600 nm [0187].

10. With regard to claim 3, in figures 1, 2 and 3, Maeda discloses that the second centered emission peak is in a range of 500-550 nm [0193].

11. With regard to claim 5, in figures 1, 2 and 3, Maeda discloses that the second silicate phosphor has a chemical formula selected from the group consisting of Ba2-

xSiO4:Eu.sup.2+x (0.001 ≤ x ≤ 1), Ca1-xMgSi2O7:Eu.sup.2+x (0.001 ≤ x ≤ 1) and Sr2-xSiO4:Eu.sup.2+x (0.001 ≤ x ≤ 1) [0198-0199].

12. With regard to claim 7, in figures 1, 2 and 3, Maeda discloses that the phosphor (2) has a particle size of d90 ≤ 20 μm, 5 ≤ d50 ≤ 10 μm [0204].

13. With regard to claim 8, in figures 1, 2 and 3, Maeda discloses that the light emitting chip emits blue light [0182].

14. With regard to claim 9, in figures 1, 2 and 3, Maeda discloses that the phosphor (2) is molded in a periphery of the light emitting chip or on the light emitting chip (1) [0177-0202].

15. With regard to claim 10, the claim limitation "the phosphor is manufactured by mixing the phosphor with a light transmitting resin" is drawn to a process of manufacturing which is incidental to the claimed apparatus. It is well established that a claimed apparatus cannot be distinguished over the prior art by a process limitation. Consequently, absent a showing of an unobvious difference between the claimed product and the prior art, the subject product-by-process claim limitation has been considered, but not patentably distinct over Maeda (see MPEP 2113). The examiner notes further that Maeda discloses the phosphor in a light transmitting resin (13) [0179].

16. With regard to claim 11, in figures 1, 2 and 3, Maeda discloses that the resin (13) is an epoxy resin or a silicon resin [0215].

17. With regard to claim 12, in figures 1, 2 and 3, Maeda discloses that the first silicate phosphor is a yellow series and the second silicate phosphor is a green series [0177-0202].

Claim Rejections - 35 USC § 103

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

19. Claims 6 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda as applied to claim 1 above, and further in view of itself.

20. With regard to claim 6, Maeda discloses all of the limitations, except it is silent as to the ratio of the first silicate phosphor to the second silicate phosphor.

21. One having ordinary skill in the art would understand that the amount of a phosphor in a light emitting device is directly related to the amount of color converted light emitted by the device. In other words, to increase the amount of color converted yellow light emitted from a light emitting device with a blue light source, one would add more yellow phosphor. The amount of phosphor can also be expressed as the ratio of phosphor to base material.

22. One of ordinary skill would further understand that when there is a light source and two or more phosphors, the overall color of the light emitted from a light emitting device would be controlled by the total amount of phosphor (phosphor/base ratio) and the ratio of one phosphor to another (Maeda [0079]. Choosing an overall color for device emission is a matter of design choice, so consequently the amount of phosphor (phosphor/base ratio) and the ratio of one phosphor to another is also a matter of design choice.

23. Therefore, at the time of invention, it would have been an obvious design choice for a person having ordinary skill in the art to construct the Maeda light emitting device where the first silicate phosphor and the second silicate phosphor exist at a ratio of 1:1 to 1:9 or 9:1 to 1:1, in order to achieve a desired overall color of emission for the device.

24. With regard to claim 18, in figures 1, 2 and 3, Maeda discloses a light emitting device comprising: a light emitting chip (1) emitting a light; and a resin-based phosphor (2) through which the light emitting from the light emitting chip (1) passes; wherein the phosphor (2) comprises a yellow silicate phosphor exciting a second light having a first centered emission peak using the first light and a green silicate phosphor exciting a third light having a second centered emission peak using the first light

25. Maeda is silent as to the ratio of the green silicate phosphor to the yellow silicate phosphor. For the reasons explained in the rejection of claim 6 above, the ratio of one phosphor to another is considered to be a matter of design choice.

26. Therefore, at the time of invention, it would have been an obvious design choice for a person having ordinary skill in the art to construct the Maeda light emitting device where the green silicate phosphor and the yellow silicate phosphor exist at a ratio of 1:2 to 1:5, in order to achieve a desired overall color of emission for the device.

27. With regard to claim 19, Maeda discloses all of the limitations, except it is silent as to the specific weigh ratio of phosphor to base. For the reasons explained in the rejection of claim 6 above, the weight ratio of phosphor to base is considered to be a matter of design choice.

28. Therefore, at the time of invention, it would have been an obvious design choice for a person having ordinary skill in the art to construct the Maeda light emitting device where the phosphor is contained at a ratio of 15-30 wt % with respect to the base so as to emit white light as the desired overall color.

29. With regard to claim 20, Maeda discloses all of the limitations, except it is silent as to the specific weigh ratio of phosphor to base. For the reasons explained in the rejection of claim 6 above, the weight ratio of phosphor to base is considered to be a matter of design choice.

30. Therefore, at the time of invention, it would have been an obvious design choice for a person having ordinary skill in the art to construct the Maeda light emitting device where the phosphor is contained at a ratio of 5-15 wt % with respect to the base so as to emit bluish light as the desired overall color.

31. Claims 4 and 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda as applied to claim 1 above, in view of Shei et al., U.S. Patent Application Publication No. 2005/0168127 A1.

32. With respect to claim 4, Maeda discloses all of the limitations, except it does not expressly disclose that the first silicate phosphor has a chemical formula of Sr3-xSiO5:Eu^{2+}x ($0 < x \leq 1$).

33. Shei, in figures 1 and 2, teaches a light emitting device have two or more phosphors, including a yellow silicate phosphor having a chemical formula Sr3-xSiO5:Eu^{2+}x ($0 < x \leq 1$) [0026-0029, 0042-0043].

34. At the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the Maeda light emitting device with a yellow silicate phosphor having a chemical formula of Sr3-xSiO5:Eu^{2+}x ($0 < x \leq 1$), as taught by Shei. This phosphor would provide excellent color conversion to yellow light to be mixed to create white or any desired color light.

35. With regard to claim 13, in figures 1, 2 and 3, Maeda discloses a phosphor (2) of a light emitting device, comprising: a first silicate phosphor excited by a light generated by a light emitting chip (1) and a second silicate phosphor excited by the light generated by the light emitting chip (1) and having a chemical formula selected from the group consisting of Ba2-xSiO4:Eu.sup.2+x ($0.001 \leq x \leq 1$), Ca1-xMgSi2O7:Eu.sup.2+x ($0.001 \leq x \leq 1$) and Sr2-xSiO4:Eu.sup.2+x ($0.001 \leq x \leq 1$).

36. Maeda does not expressly disclose that the first silicate phosphor has a chemical formula of Sr3-xSiO5:Eu^{2+}x ($0 < x \leq 1$). Shei, in figures 1 and 2, teaches a light emitting device have two or more phosphors, including a yellow silicate phosphor having a chemical formula Sr3-xSiO5:Eu^{2+}x ($0 < x \leq 1$) [0026-0029, 0042-0043].

37. At the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the Maeda phosphor with a first silicate phosphor having a chemical formula of Sr3-xSiO5:Eu^{2+}x ($0 < x \leq 1$), as taught by Shei. This phosphor would provide excellent color conversion to yellow light to be mixed to create white or any desired color light.

38. With regard to claim 14, in figures 1, 2 and 3, Maeda discloses a light emitting device comprising: a substrate (4); a light emitting chip (1) emitting a light; a connection

part for electrically connecting the substrate (4) with the light emitting chip (1); a phosphor (2) encapsulating the light emitting chip (1) and through which the light passes; a first silicate phosphor contained in the phosphor (2) and a second silicate phosphor contained in the phosphor (2) and having a chemical formula selected from the group consisting of Ba2-xSiO4:Eu.sup.2+x (0.001 ≤ x ≤ 1), Ca1-xMgSi2O7:Eu.sup.2+x (0.001 ≤ x ≤ 1) and Sr2-xSiO4:Eu.sup.2+x (0.001 ≤ x ≤ 1).

39. Maeda does not expressly disclose that the first silicate phosphor has a chemical formula of Sr3-xSiO5:Eu^{2+}x (0 < x ≤ 1). Shei, in figures 1 and 2, teaches a light emitting device have two or more phosphors, including a yellow silicate phosphor having a chemical formula Sr3-xSiO5:Eu^{2+}x (0 < x ≤ 1) [0026-0029, 0042-0043].

40. At the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the Maeda light emitting device with a yellow silicate phosphor having a chemical formula of Sr3-xSiO5:Eu^{2+}x (0 < x ≤ 1), as taught by Shei. This phosphor would provide excellent color conversion to yellow light to be mixed to create white or any desired color light.

41. With regard to claim 15, Maeda discloses all of the limitations, including that the light emitting device is a top view type [0177-0202]. However, Maeda is silent as to the ratio of the first silicate phosphor to the second silicate phosphor.

42. One having ordinary skill in the art would understand that the amount of a phosphor in a light emitting device is directly related to the amount of color converted light emitted by the device. In other words, to increase the amount of color converted yellow light emitted from a light emitting device with a blue light source, one would add

more yellow phosphor. The amount of phosphor can also be expressed as the ratio of phosphor to base material.

43. One of ordinary skill would further understand that when there is a light source and two or more phosphors, the overall color of the light emitted from a light emitting device would be controlled by the total amount of phosphor (phosphor/base ratio) and the ratio of one phosphor to another (Maeda [0079]. Choosing an overall color for device emission is a matter of design choice, so consequently the amount of phosphor (phosphor/base ratio) and the ratio of one phosphor to another is also a matter of design choice.

44. Therefore, at the time of invention, it would have been an obvious design choice for a person having ordinary skill in the art to construct the Maeda light emitting device where the first silicate phosphor and the second silicate phosphor exist at a ratio of 1:2 to 1:3, in order to achieve a desired overall color of emission for the device.

45. With regard to claim 16, Maeda discloses all of the limitations, including that the light emitting device is a side view type [0177-0202]. However, Maeda is silent as to the ratio of the first silicate phosphor to the second silicate phosphor.

46. For the reasons explained in the rejection of claim 15 above, the weight ratio of phosphor to base is considered to be a matter of design choice. Therefore, at the time of invention, it would have been an obvious design choice for a person having ordinary skill in the art to construct the Maeda light emitting device where the first silicate phosphor and the second silicate phosphor exist at a ratio of 1:3 to 1:4, in order to achieve a desired overall color of emission for the device.

47. With regard to claim 17, in figures 1, 2 and 3, Maeda discloses a light emitting device comprising: a leadframe (6); a light emitting chip (1) emitting a light; a connection part (not labeled) for electrically connecting the leadframe (6) with the light emitting chip (1); a phosphor (2) encapsulating and molding the light emitting chip (1) and through which the light passes; a first silicate phosphor contained in the phosphor (2) and a second silicate phosphor contained in the phosphor (2) and having a chemical formula selected from the group consisting of Ba2-xSiO4:Eu.sup.2+x (0.001 ≤ x ≤ 1), Ca1-xMgSi2O7:Eu.sup.2+x (0.001 ≤ x ≤ 1) and Sr2-xSiO4:Eu.sup.2+x (0.001 ≤ x ≤ 1).

48. Maeda does not expressly disclose that the first silicate phosphor has a chemical formula of Sr3-xSiO5:Eu^{2+}x (0 < x ≤ 1). Shei, in figures 1 and 2, teaches a light emitting device have two or more phosphors, including a yellow silicate phosphor having a chemical formula Sr3-xSiO5:Eu^{2+}x (0 < x ≤ 1) [0026-0029, 0042-0043].

49. At the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the Maeda light emitting device with a yellow silicate phosphor having a chemical formula of Sr3-xSiO5:Eu^{2+}x (0 < x ≤ 1), as taught by Shei. This phosphor would provide excellent color conversion to yellow light to be mixed to create white or any desired color light.

Conclusion

50. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas A. Hollweg whose telephone number is (571) 270-1739. The examiner can normally be reached on Monday through Friday 7:30am-5:00pm E.S.T..

51. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

52. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/TH/

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